KEWA

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ONTARIO ARCHAEOLOGICAL SOCIETY
c/o Museum of Ontario Archaeology
1600 Attawandaron Road, London, ON N6G 3M6

LONDON CHAPTER OAS

March and April 2008 08-3 & 4

Holiday Greetings to One and All!

Come and join us for the OAS Christmas party, which will be held at the Museum on Thursday, December 10th beginning at 7:00 PM. Snacks and soft drinks will be provided (but BYOB).

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The Christmas party replaces the monthly meeting. The next meeting will be held January 10th at 8 pm at the Museum of Ontario Archaeology, 1600 Attawandaron Road, near the corner of Wonderland & Fanshawe Park Road, in the northwest part of the city.

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AREA C OF THE GREEN HILL SITE (AGHK-39): A SMALLPOINT ARCHAIC COMPONENT

Sherri H. Pearce and Chris J. Ellis

This paper provides a description and analysis of the material recovered from Area C at the Green Hill site (AgHk-39). The site is near Thedford, Ontario and is an undisturbed, multi-component site comprised of occupations dating to the Late Archaic to perhaps Early Woodland, or ca. 4000 to 2300 RCYBP. Area C is argued to be a spatially discrete occupation dating to the Small Point Archaic (ca. 3500-2800 RCYBP; see Ellis et al. 1990, 2009; Spence and Fox 1986) based on the density and spatial patterning of the material recovered and the inclusion of several diagnostics of that time period (Ellis 2007).

BACKGROUND

The Green Hill site is located in the Huron Fringe physiographic region near the eastern shore of Lake Huron (Figure 1). The Huron Fringe is characterized by sand terraces, boulders and gravel bars, remnants of the shorelines of glacial Lakes Algonquin and Nipissing (Chapman and Putnam 1973:264-265). The Green Hill site is located in a woodlot on a bluff overlooking the Ausable River valley.

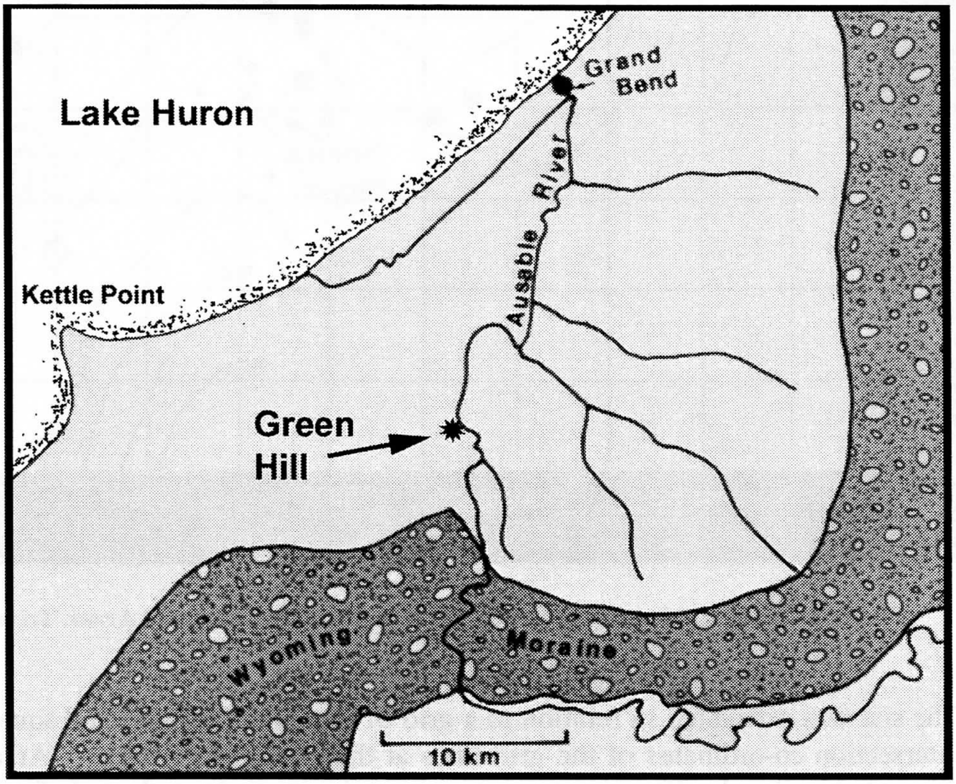

Figure 1: Green Hill Site Location in Southeastern Lake Ontario Area

Test excavations at the site spanned a four year period from 2003 to 2006 and are part of an ongoing research project investigating the Late Archaic in south-western Ontario.

Excavations to date have determined that the site covers an area extending at least 1800 m^2, although it is estimated to be much larger (Ellis 2006, 2007). Work has been carried out in three main site areas referenced as areas A, B, and C (Figure 2). Area A seems to have an Early Woodland and Small Point component although no diagnostic points were recovered. Area B has a definitive Small Point component as represented by a single point recovery but there are also suggestions of a Late Archaic Broad Point component based on the flaking debris (e.g. presence of very large biface thinning flakes). However, as noted, the excavated portion of Area C seems to represent solely a Small Point Archaic occupation.

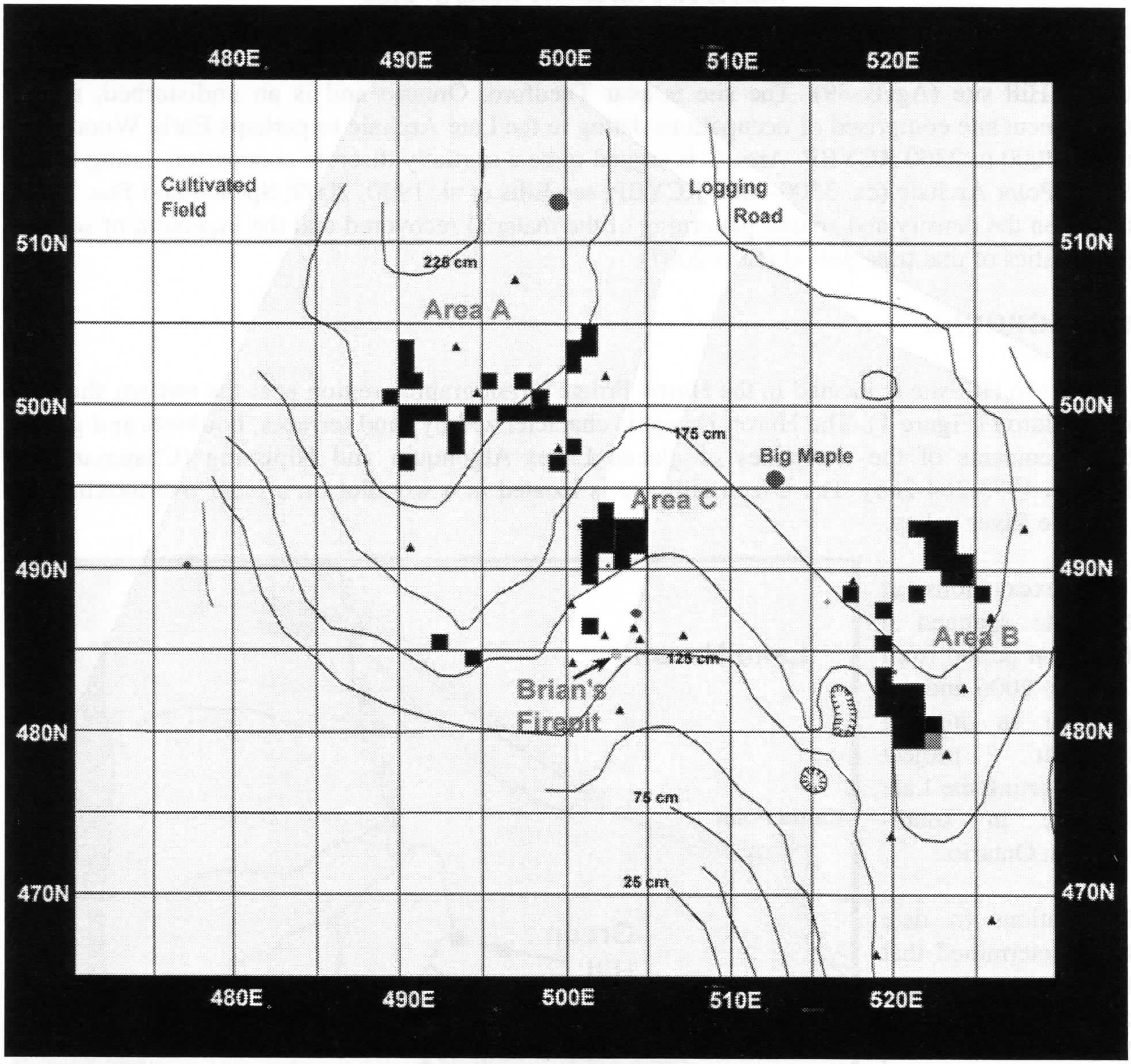

Figure 2: Topographic Map of Green Hill Site Showing Excavated Areas. Triangles are shovel tests.

The site was excavated in relation to a grid of one metre squares and squares were named by the intersection co-ordinates of the grid lines at their southwest corners. Area C has yet to be fully excavated and only 12 one metre square units were investigated. Each square was initially excavated with shovels and all soil passed through ¼" mesh. However, when debris was encountered, which happened in every square, excavation switched to trowelling and screening with ¼" mesh. The Area C excavations have yielded a total of 329 lithic artifacts exclusive of over 30 kg (2,863 pieces) of fire-cracked rock (referenced throughout the remainder of the paper as FCR).

An outstanding aspect of the site as a whole is the presence of numerous features rarely seen on Ontario Archaic sites. They include pits of various forms and even linear fire-cracked rock clusters that may represent simply dumps from episodes of stone boiling. These kinds of features are mainly shallow ones that would be completely removed on ploughed sites. In fact, we believe only one or two of the 25 features recorded on the site as a whole would have been deep enough to have been found on a ploughed site. Four features were encountered in Area C (Figure 3). One was a small oval pit feature (#12) with a single piece of FCR while another was an artifact feature (e.g. with no visible outline), consisting solely of a discrete concentration of FCR found at the northwest corner of 492N/503E, called Feature #22 (Figure 3). As it extends into surrounding unexcavated squares, Feature #22's exact extent cannot be determined -- but the excavated area included 14 pieces of FCR weighing a total of 0.45 kg.

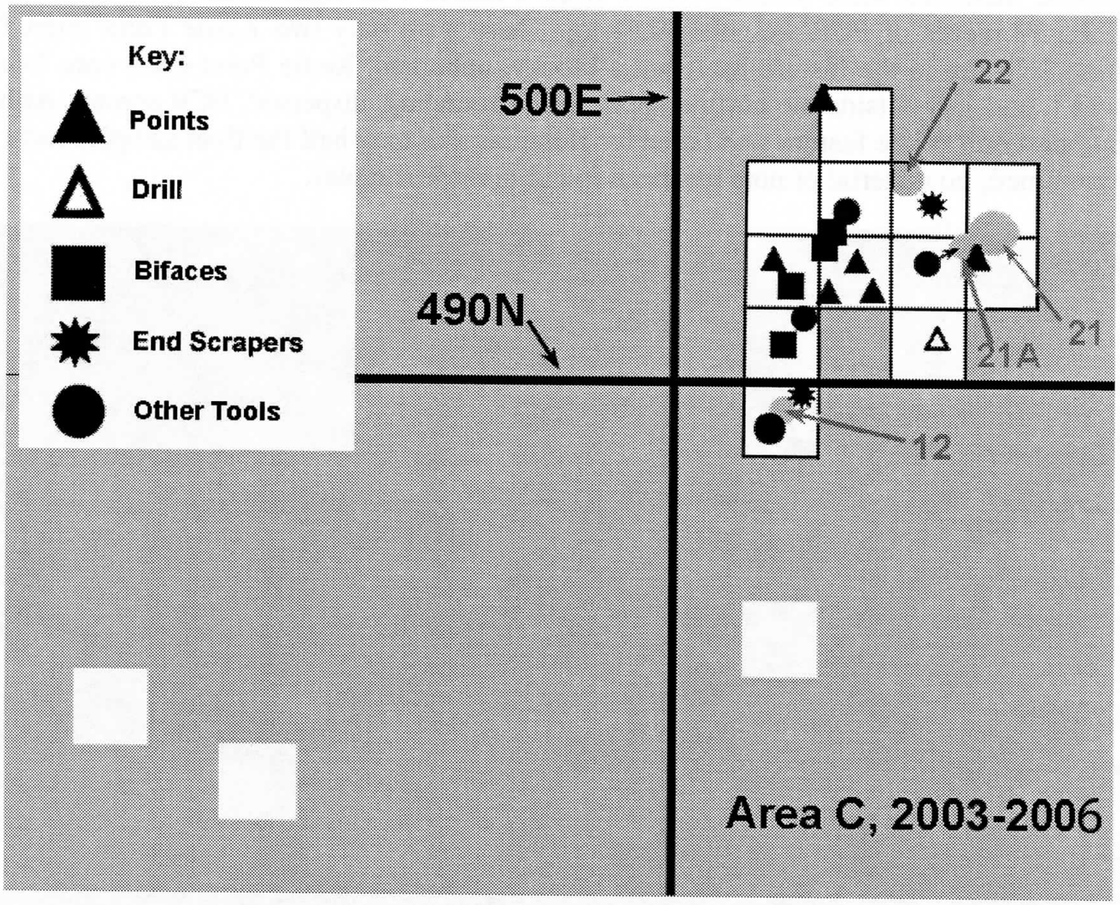

Figure 3: Map of Area C Showing Artifact and Feature Locations.

The other two features, called 21 and 21A, are complex structural ones with visible outlines and they abut one another in the eastern part of the excavated area (Figure 3). Hence, we originally thought they were one feature. Feature 21A was the first encountered during excavation of square 491N/503E. It was clear it extended to the east and northeast into unexcavated units so excavation was begun in those units. The expanded excavation exposed a larger, interconnected feature we subsequently called Feature #21. Feature 21 was a large, roughly circular pit of about 66 cm in diameter with a very dark brown (10YR2/2 in the Munsell system), homogeneous fill (Figures 4, 5 & 6). It intersected with 21A at its southwest extremity (Figure 6). It was hard to tell if 21 was dug before or after 21A but our feeling was that 21A was made later. Feature 21 consists in profile of a shallow basin of at least 8 cm deep (Figure 6). “At least” should be emphasized because it is often hard to distinguish exactly where the overlying topsoil ends and dark organic rich features begin at Green Hill. A large amount of FCR was found surrounding that feature and extending away from it and it is possible the rock may have been more concentrated around the margins and dispersed somewhat by post-depositional root penetration, a process that has definitely disturbed several other features at the site (Ellis 2005). FCR was also found within the feature, although rarely, and it tended to be near the margins. It is also possible, however, that the feature was something such as an earth oven or roasting feature that when opened up to remove the organic contents, dispersed the heated rocks in the central fill. Certainly, there was no evidence in the form of fire-reddened soil, that this feature was a hearth. Regardless, including three pieces of FCR from a rodent hole right under the Feature #21, it contained 37 pieces of FCR weighing 0.54 kg. There were only two Kettle Point chert flakes weighing 2.74 gm in the feature itself but a blocky, unburned, Kettle Point chert core from the area was found just outside the north edge in the surrounding, dispersed, FCR spread. Although the southeast half of the feature was taken for flotation, and only half the float samples have been fully examined, no material of note has been found in those samples.

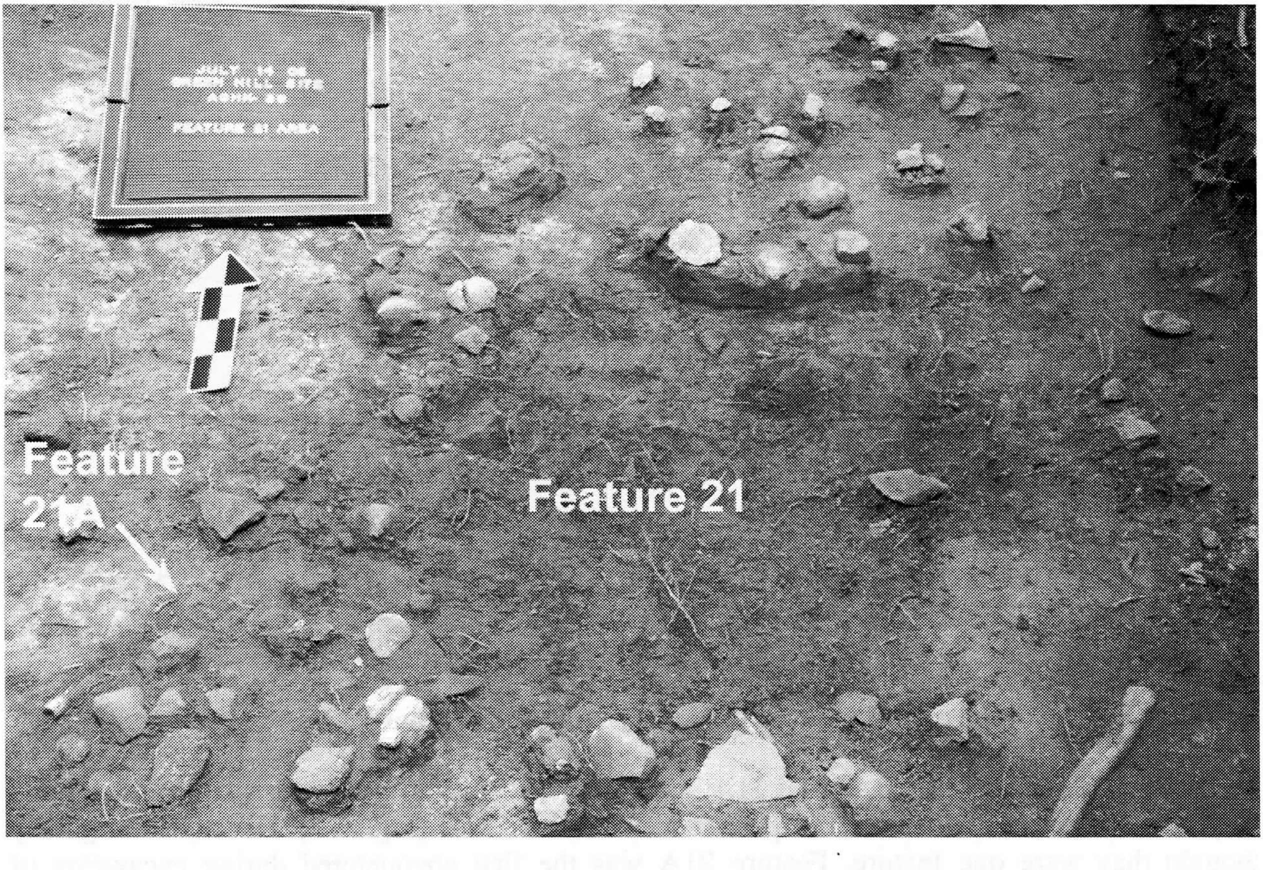

Figure 4: Feature 21 and 21A.

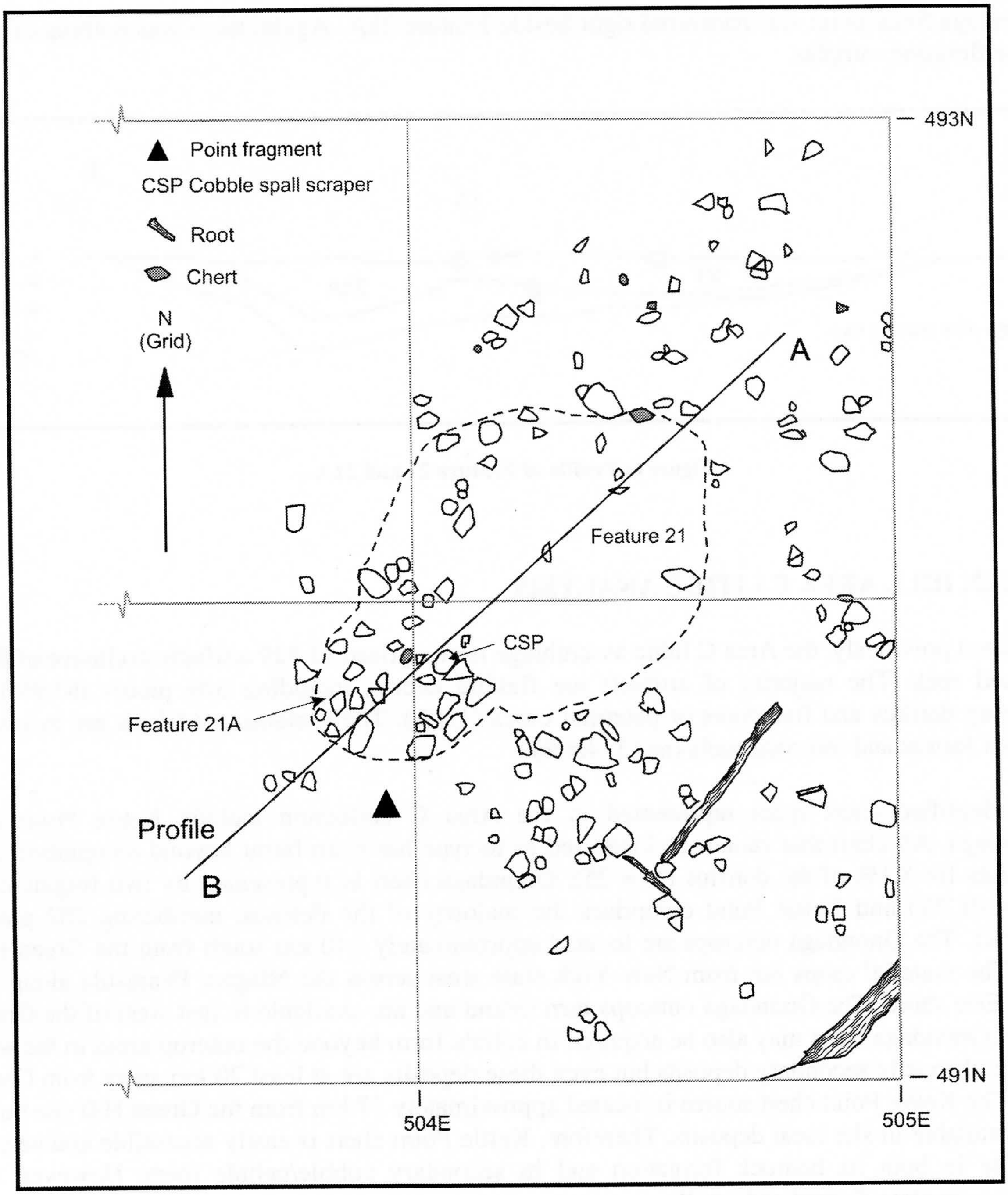

Figure 5: Map of Feature 21 and 21A. Open symbols represent fire-cracked rocks.

Feature 21A was a smaller circular pit of about 35 cm across; it had a basin shaped cross-section of some 12 cm deep that also had a very dark brown fill (10YR2/2). The feature had a denser concentration of FCR (68 pieces weighing 1.72 kg) with no suggestion of more peripheral concentration as was seen in #21. Only a single Kettle Point chert waste flake, weighing 1.23 gm, was recovered from Feature #21A. However, also recovered in the feature was a cobble spall tool or "bust-off," which, as discussed below, is apparently characteristic of the Smallpoint Archaic, suggesting the feature is associated with that component. Indeed, the corner of an

Onondaga Smallpoint was recovered right beside Feature 21A. Again, there was nothing of note in the flotation samples.

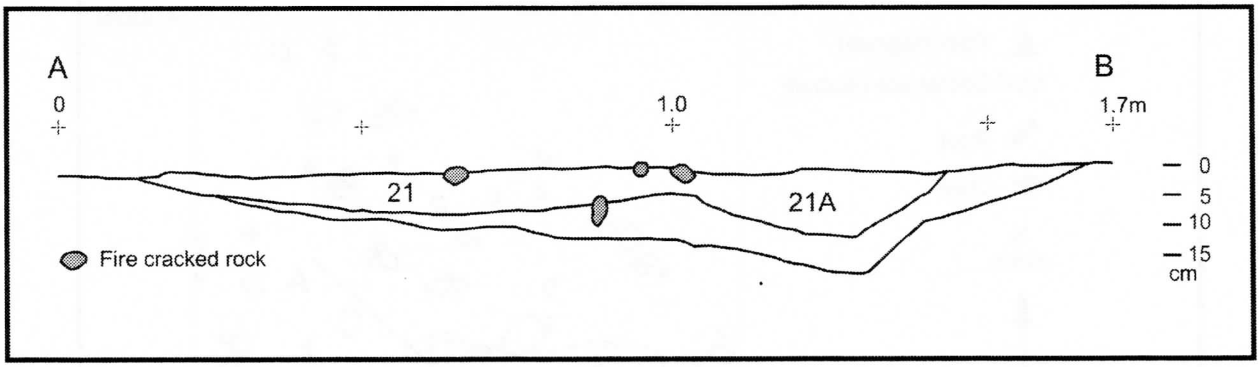

Figure 6: Profile of Feature 21 and 21A.

GREEN HILL AREA C LITHIC ANALYSIS

As stated previously, the Area C lithic assemblage is comprised of 329 artifacts exclusive of fire-cracked rock. The majority of artifacts are flaking debris, including 309 pieces (93.9%) of chipping detritus and five cores or potential cores (1.5%). The remaining artifacts are inclusive of both formal and informal tools (n=15; 4.6%).

The identified chert types represented in the Area C collection include Kettle Point and Onondaga. All chert that cannot be identified as to type has been burnt beyond recognition and accounts for 8.1% of the detritus (N = 25). Onondaga chert is represented by two fragmentary flakes (0.7%) and Kettle Point comprises the majority of the detritus, numbering 282 pieces (91.2%). The Onondaga outcrops are located approximately 140 km south from the Green Hill site. The material crops out from New York state west across the Niagara Peninsula along the Lake Erie shore. The Onondaga outcrops turn inland and are available to just west of the Grand River. Onondaga chert may also be acquired in cobble form beyond the outcrop areas to the west and southwest in secondary deposits but even these deposits are at least 70 km away from Green Hill. The Kettle Point chert source is located approximately 17 km from the Green Hill site but is also available in site local deposits. Therefore, Kettle Point chert is easily accessible and near to the site in both its bedrock formation and in secondary cobble/pebble form. However, the pebbles are often flawed and small.

Flaking Debris

Cores

Five cores or potential cores were recovered from Area C, all of which are on Kettle Point chert. The core metrics may be found in Table 1.

Table 1: Area C Cores

Provenience/ Catalogue #	Core Type	Description	Chert Type	Weight	Length	Width	Thickness
				grams	mm		
490N501E/ #44	Bipolar?/ Biface Fragment?	Fragment	Kettle Point	3.37	16.1	23.4	10.0
491N501E/ #46	Bipolar?/ Biface Fragment?	Opposing Area	Kettle Point	3.57	28.4	17.7	10.7
492N504E/ topsoil	Bipolar	Opposing Ridge	Kettle Point	6.58	23.4	25.0	10.7
491N504E/ #47	Bidirectional	--	Kettle Point	74.22	58.3	44.6	26.5
490N501E/ #45	Random	--	Kettle Point	84.54	42.6	54.0	33.0

All of the cores recovered are on Kettle Point chert. Three of the them could be smaller bipolar forms (e.g. with flakes originating from two opposing, somewhat crushed ends), two of which are quite fragmentary and lack any cortical remnants but one more complete item has a tabular cortex remnant. Where possible on Table 1, in describing the areas of modification (i.e., opposing ridge, opposing area, etc.) on the bipolar items we have followed Binford and Quimby's (1972) typology. It is interesting, given the number of bipolar cores, that more bipolar flaking debris was not recovered; with that being said, shatter, primary and secondary flakes have been associated with bipolar reduction (Keron 2003; Binford and Quimby 1972) and bipolar flakes are often difficult to identify (Goodyear 1993). Also, it could be argued that the lack of bipolar flakes may be due to sample bias given that only a small portion of Area C has been excavated to date. Finally, it is sometimes, as with the two fragmentary examples here (Field Catalogue FC#44, #46), hard to distinguish a bipolar fragment from that of a fragmentary early stage biface.

Even if all are bipolar pieces and not biface fragments, there is some debate amongst archaeologists as to whether bipolar forms are actual cores or if they are tools (see Hayden 1980; LeBlanc 1992; Lothrop and Gramly 1982; Goodyear 1993; Shott 1989:2). It might be better therefore to refer to these items by the more neutral or descriptive term "*pièce esquillées*" or "scaled pieces," so called because the overlapping flake scars resemble fish scales. Regardless, the main disagreement lies in the interpretation of artifact function and of defining morphological characteristics. Those who see these as tools argue they were wedges used to split wood or bone and as they would be rotated in use, they would pick up battering from several different margins. By contrast, those who argue they are cores suggest that where raw material pieces are small it is easier to derive useable flakes by setting them on stone anvils and smashing the pieces resulting in the bipolar battering. As phrased by LeBlanc (1992: 10), use of "bipolar reduction is an effective adaptation to flaking small-sized raw material sources" such as pebbles or cobbles. Differentiating between what is a bipolar core and what is a wedge is difficult and as argued by LeBlanc (1992:1, 3-5), in the absence of good organic preservation of bone and wood materials, only use-wear analyses will provide us with any definite answers.

Secondary cobble/pebble sources of Kettle Point are available at Green Hill and there were some blocky cores recovered that do seem to be from such sources (see below). However, given that the primary source is so close to the site and that secondary sources tend to be flawed, one could argue it is doubtful the people using Area C were extensively employing such lithic sources. Also, Hayden (1980:4) states that if people were relying on pebble sources, one should expect the presence of pitted anvil stones to be found in conjunction with bipolar cores. To date, no anvil stones have been recovered from Green Hill Area C. Wedges are often seen as being relatively thin flaked stone artifacts displaying bipolar faceting or splintering on various axes that rarely extend the length of the specimen. All of the items designated as bipolar do not fit this description; rather, they are somewhat chunky despite their small size. In any case, due to their small size and fragmentary nature, it is difficult to determine the exact function of the Green Hill examples, whether as core or wedge. That being said, given the rarity of bipolar flaking debris in the assemblage and lack of pitted anvil stones, these artifacts may very well be wedges.

As for the remaining two objects, these are definitively cores. They are large, blocky forms and both have extensive unflaked surfaces including cortex remnants. The cortex is a bit battered and weathered suggesting use of secondary deposits. One of these cores is thick, square in shape, and has had only two or three flakes removed randomly from one face. One gets the impression that the knapper simply knocked off a couple of flakes, thought the core was too flawed to reduce, and then simply discarded it -- perhaps this raw material piece was obtained in site local deposits and tested on the spot. The other blocky core is a bit thinner and rectangular in plan. While one face is completely unflaked, the other face has had flakes removed from both ends and bidirectionally over the entire surface. Nonetheless, only about seven flake scars are present and the shape/profile suggests it was not extensively reduced prior to discard.

Chipping Detritus

The flaking debris analysis was conducted following a typological approach. Table 2 presents the pertinent data on the debitage collection. As can be seen in Table 2, the majority of the chipping detritus is composed of thin flake fragments lacking distinct platforms (n=207; 67.0%). In and of themselves, flake fragments tell us little about manufacturing behaviours but are useful indicators of the types of chert represented in the collection. The second most frequent flake type is shatter (n=51; 16.5%). Shatter is undiagnostic blocky fragments of chert that break off of the parent core and are usually attributed to the early stages of reduction (e.g. Binford and Quimby 1972) but they can result from other activities.

Biface reduction flakes are the third most numerous flake type present in the Green Hill Area C lithic assemblage (n=45; 14.5%). As the name implies, these flakes are associated with the manufacture of bifaces and they are dominated by larger thinning flakes as opposed to smaller retouch flakes. The low incidence of the smaller flakes may be taken as an indicator of an absence of tool finishing or resharpening. However, we caution such flakes are generally so small that they would have a tendency to fall through ¼" mesh screen. Flakes from biface manufacture display distinctive morphological characteristics. One characteristic is a more prepared, often ground and beveled, striking platform in comparison to early stage debris like primary and secondary flakes that display little platform preparation and have right-angled platforms (e.g. Frison 1968). Such preparation is necessary to thicken the relatively thin biface edge so it will not collapse during manufacture. Platforms are also quite acute-angled, mirroring the thin edges/platforms of the bifaces compared to blocky cores. Another characteristic is complex dorsal scar patterns that are centripetal or bidirectional in orientation reflecting the fact bifaces have more than one edge from which flakes are removed and more often, two opposing edges such that the removals from each edge overlap in the middle of the tool/face.

Table 2: Area C Chipping Detritus

Flake Type		Chert Type			Total	%
		Onondaga	Kettle Point	Unidentified		
Bipolar		0	2	0	2	*.7*
Biface Reduction Flakes		0	44	1	45	*14.5*
Fragment		2	188	17	207	*67.0*
Primary		0	1	0	1	*.3*
Secondary		0	3	0	3	*1.0*
Shatter		0	44	7	51	*16.5*
Totals	frequency	2	282	25	309	*100.0*
	%	*.7*	*91.2*	*8.1*	*100.0*	

At least one of the biface reduction flakes is what Deller and Ellis (1992:86) call biface reduction errors. Biface reduction errors occur when an edge collapses or breaks off, producing an edge "bite" or small semi-circular depression on the biface edge rather than removing a thin flake from the biface surface. The result is a short flake with an abrupt termination and excessively large platform in relation to overall flake size. This edge collapse may be due to several factors including micro-fractures or inclusions in the rock itself or incorrect preparation of the striking platform.

All other flake types are minimally represented. Primary and secondary flakes (e.g. those with unflaked facets on all or part of the dorsal surface) and bipolar flaking debris account for only six pieces (2.0%) of the assemblage. Traditionally, these flake types, along with shatter, are seen as indicative of early stage tool production and their rarity can be used to suggest little primary reduction of cores occurred at the site. Such a view would be consistent with the few potential cores recovered. As noted three of the "cores" may actually be tools such as wedges and the other two more blocky cores have been reduced very little based on the low number of flake scars and extensive unflaked surface remnants. Moreover, no tertiary flakes were observed. These tertiary flakes are ones with more right-angled platforms from earlier stages of reduction but which lack dorsal cortex or unflaked surfaces indicating they are not the earliest removals from certain areas of the core. Therefore, it is possible that more blocky cores were not extensively reduced at the site, or that knappers simply tested and only occasionally used local cobbles, or if earlier stages of reduction were extensively carried out it was not in the area excavated but in more peripheral occupation areas. It is also possible that that the initial raw material pieces were small and that they were intended to be reduced largely to small bifaces. As a consequence, all early stage flakes have some cortex present and the later stages would be represented by the biface thinning flakes. In essence, the primary/secondary flakes represent initial removals before a bifacial platform or edge is formed on the objective piece. It is even possible that the material was quite flawed and that the shatter represents actual breakage in earlier stages of biface manufacture.

On the whole, the main lithic activity we documented at Area C was in roughing out of preforms and bifaces and there is little evidence of the primary reduction of blocky cores. Such an explanation is consistent with these data: primary and secondary flakes are very rare; tertiary flakes are totally absent; the blocky cores recovered have not been much reduced; and some biface preforms were recovered from the site (see below). The relatively high incidence of shatter might contradict such an interpretation but it is possible these are from the reduction of the bipolar pieces as cores or as wedges or even from early stages of roughing out bifaces. The absence/rarity of tertiary core reduction flakes might also be used to suggest that the few primary and secondary flakes (e.g. with some cortex/unflaked surfaces) present actually represent the very earliest stage of biface reduction from small pebbles or nodules. The larger size of the biface reduction flakes suggests an emphasis on the early stages of roughing out bifaces as opposed to tool finishing.

Tools/Preforms

Table 3 summarizes the various tools recovered from Area C sorted by chert and tool types. In total, seven artifact forms are represented or eight if one regards the bipolar pieces described earlier as wedges.

Table 3: Area C Tools

Tool Type		**Chert Type**			**Totals**	
		Onondaga	**Kettle Point**	**Sub-greywacke**	**Freq.**	**%**
Biface		0	1	0	1	*6.7*
Drill		1	0	0	1	*6.7*
Projectile Point		3	3	0	6	*40.0*
Preform		0	2	0	2	*13.3*
End Scrapers		0	2	0	2	*13.3*
Linear Side Scraper/ Denticulate		0	1	0	1	*6.7*
Denticulate		1	0	0	1	*6.7*
Scraper / Bust-Off		0	0	1	1	*6.7*
Totals	frequency	5	9	1	15	*100.1*
	%	*33.3*	*60*	*6.7*	*100*	

Projectile Points

Six Small Point Archaic corner to side-notched projectile points (Figure 7b-e) were recovered from Area C, including four from a small area just west of Feature 21/21A (Figure 3) suggesting perhaps a specialized work area. Amongst these items are five bases, three of which are snapped across the notched area and two of which are snapped just above the notch. The sixth point (Field Catalogue [FC] #40) is a basal corner that also retains part of the lateral edge above the notch. This item has been burnt and displays potlidding and was found at the edge of Feature #21A. Table 4 details the projectile point metric and morphological data. The only width measurements recorded are the maximum widths at the base due to incompleteness; one specimen, FC #'s 40, is broken and as such width measurements are incomplete. Only FC specimens #37 and #28 are complete enough to allow for other measurements. Point #28 has a neck width of 13.9mm while point #37 has a neck width of 17.1mm. The base of this later point is slightly ground.

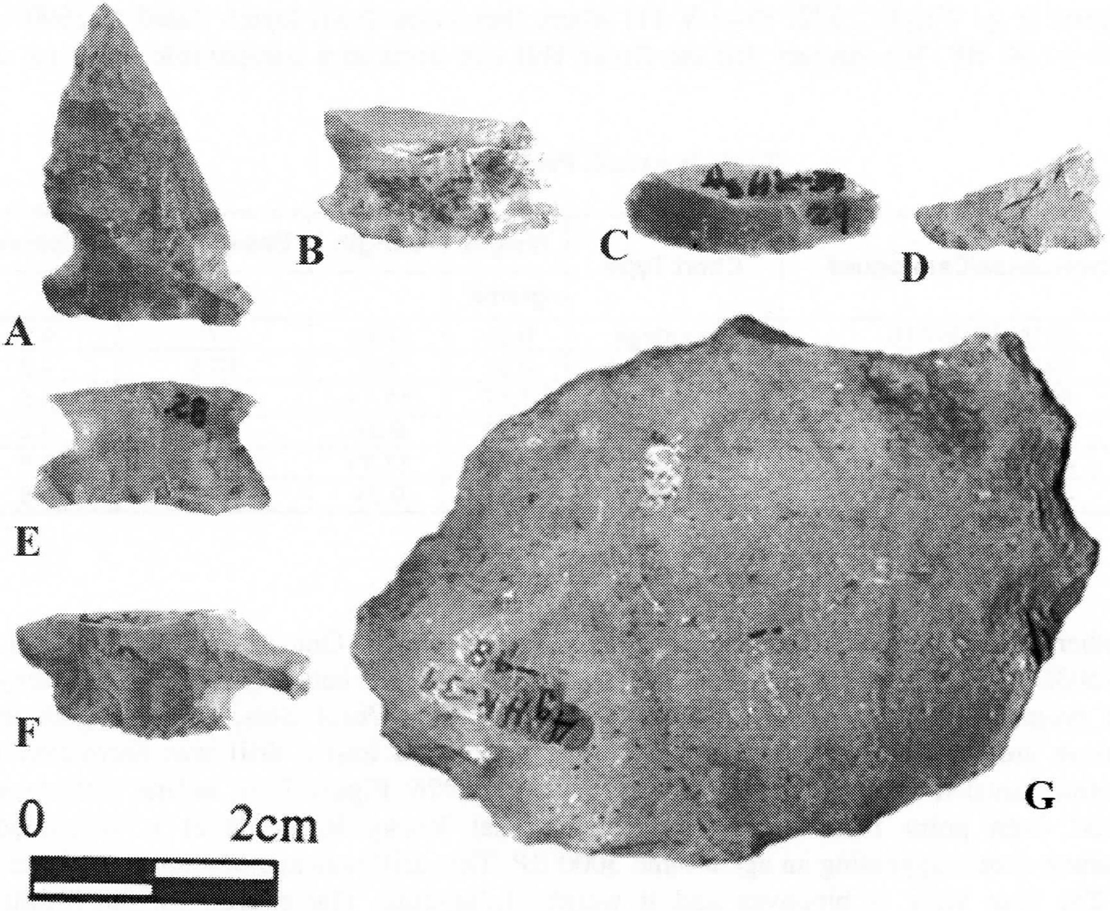

Figure 7: Points (A-E), Drill (F) and Cobble Spall Scraper (G). A is from Area B but all other points are from Area C.

Overall, the points are, as the term implies, quite small, with tiny corner to side notching, slightly convex to straight bases and pointed/sharp to only slightly rounded corners below the notch. In terms of these characteristics, of all the *named* Small Point Archaic types they are most like those of the Crawford Knoll type (Ellis et al. 1990:107) and differ significantly from the larger Hind type and more expanding stemmed Innes type. However, the basal width of the Green Hill items is greater than that for the points at the Crawford Knoll site itself. For example, the Green Hill points average 18.5 mm at the base and the largest point from Crawford Knoll is only 18 cm with an overall average of 12.2 cm (I. Kenyon 1989: Table 1). Perhaps not surprisingly, in terms of basal width, as well as outline shape, the points from Green Hill are most comparable to the untyped items from sites at Inverhuron just to the north of Green Hill, such as Rocky Ridge (basal average = 18.7 mm) and Inverhuron (basal average = 16.7 mm). Moreover, two of the

Green Hill points have pointed, apparently deliberately narrowed, apexes of the tips of the tangs below the notch (Figure 7b, e). This deliberate narrowing is a feature seen on Smallpoints in other areas, notably on a find from in a feature at the nearby Thedford II site dated to 3020+/-80 BP (Ellis et al.1990a), and from the Knechtel I site to the north at Inverhuron (e.g. Wright 1972: Plate V-11) where they come from layers dated at 2690+/-45 to 3250 +/-90 BP. We suspect that the Green Hill site dates to a comparable time, ca. 3000 BP.

Table 4: Area C Projectile Points.

Provenience/Catalogue#	Chert Type	Weight	Length	Basal Width	Thickness
		grams	mm		
491N-504E/#40	Onondaga	0.91	12.0+	?	4.1
491N-502E/#39	Kettle Point	0.31	6.0	13.5	4.6
493N-502E/#28	Kettle Point	1.17	11.1+	20.2	4.6
491N-501E/#29	Kettle Point	0.47	8.3+	21.7	3.2
491N-502E/#37	Onondaga	1.10	11.7+	21.0	4.5
491N-502E/#38	Onondaga	0.31	9.0+	16.1	3.6

Other Bifaces

Four other bifaces were recovered from Area C (see Table 5). One item is classed as a drill (490N-503E/#31; Figure 7f). It has a corner-notched base and had most likely been recycled from a projectile point. Similar tools occur at other Small Point sites, notably again in the Inverhuron area. Specifically, a comparable point reworked into a drill was recovered from Occupation Level II at the Rocky Ridge site (Ramsden 1976: Figure 18a). In line with the dates estimated from point form comparisons above, that Rocky Ridge level is bracketed by radiocarbon dates suggesting an age around 3000 BP. This drill was manufactured on Onondaga chert. The plan view is biconvex and it weighs 1.16grams. The overall length, width and thickness are 24.9mm, 11.2mm and 5.4mm. The stem length of the drill is 5.7mm.

The other three bifaces are on Kettle Point chert (Table 5). One item, FC#35 is very thin and narrow, is finely flaked and has lateral edges that are slightly convex. This biface is most likely the midsection of a projectile point but we cannot be certain. It was also recovered from the same one metre unit as the three points noted above. Two other bifaces, including a complete item (FC#36; Figure 8b) and a basal segment (FC#4; Figure 8a) are small bifaces with triangular to tear-drop shaped outlines. They are identical in form and workmanship to the preforms for Small Points reported at other sites (e.g. Ellis et al. 1990: Figure 4.25; Ramsden 1976: Figure 12d-e). Both items retain many unflaked surfaces of the flake upon which they were made and the complete item is rather coarsely flaked, suggesting both bifaces are in earlier stages of manufacture and consistent with the larger size of the biface reduction flakes found at the site. Again, one of these items, the complete item, was found in the same square (491N/502E) as three point bases and the mid-section just described, suggesting perhaps a specialized work area where points were rehafted and preforms roughed out. In fact, the two fragmentary "bipolar cores," which also potentially could be early stage biface fragments, were also found in adjacent squares.

Table 5: Area C: Other Bifaces

Provenience/ Catalogue #	Type	Description	Chert Type	Weight	Length	Width	Thickness
				grams	mm		
491N-502E/#35	Point?	Mid-section	Kettle Point	0.80	15.3	17.4	3.2
489N-501E/#4	Preform	Base	Kettle Point	7.86	27.4	29.1	9.0
491N-502E/#36	Preform	Crawford Knoll?	Kettle Point	9.81	37.0	29.4	8.9
490N-503E/#	drill	reworked ppo	on	1.16			

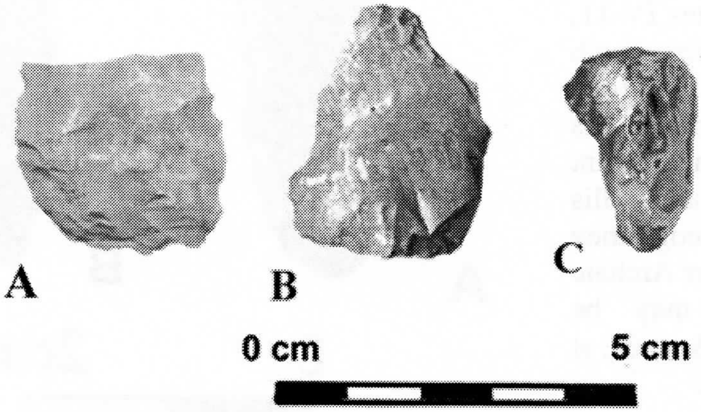

Figure 8: Small Trianguloid Preforms (A-B) and End Scrapers (C-D), Green Hill Area C.

Scrapers

Scrapers (N = 3) account for 20.0% of the tool assemblage recovered from Area C and all pertinent data are displayed in Table 6. All of the scrapers were manufactured on Kettle Point chert.

Table 6: Chert Scraper Measurements.

Provenience	Scraper Type	Chert Type	Weight	Length	Width	Thickness
			grams	Overall specimen (mm)		
490N-501E/#30	Side	Kettle Point	2.88	49.8	15.6	4.1
489N-501E/# 3	End	Kettle Point	2.63	19.3	16.8	7.3
492N-503E/#49	End	Kettle Point	8.11	31.1	19.3	14.6

One of the scrapers (FC#30) is a side scraper manufactured on a very long and narrow or blade-like flake (Figure 9b). The left lateral margin has been continuously and skillfully retouched all along the edge for 48.5 mm to form a 2.5 mm thick working edge with a relatively acute, 35-50°, edge angle. It has also been retouched for 23 mm along the right margin from the platform end to form a thicker (4.5 mm), 65-75° edge. This retouch may be simply backing to dull the edge so it can be comfortably held in use. In plan, the continuous thinner edge is somewhat irregular and almost denticulated and it is probable these "scrapers" actually served as cutting tools. The use of such linear, blade-like flakes for such unifaces is reported from other Small Point sites. Very similar items were recovered from the Small Point Archaic layers at Knechtel I (Wright 1972: Plates IV-11, V-6, VI-13-17) and also from both Areas A and B at Green Hill (e.g. Figure 9a), the latter of which also has definitive evidence of a Small Point occupation (see Figure 7a and Ellis [2007a:11-12]). To our knowledge they are not reported from any other Archaic contexts, suggesting they may be diagnostic of the Small Point Archaic, at least in the Lake Huron region.

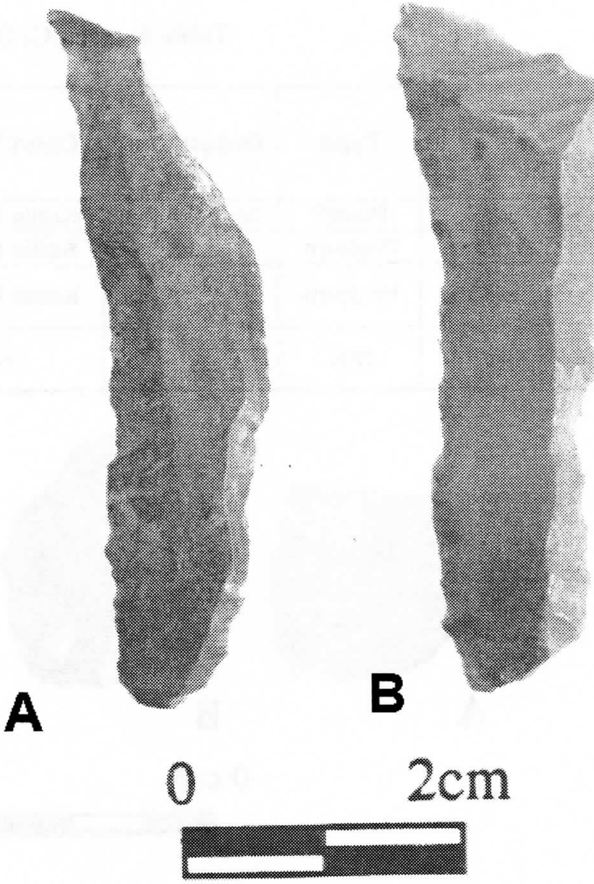

Figure 9: Retouched Linear Flakes, Green Hill Site. A is from Area B and B is from Area C

The remaining two items are small, but relatively thick, fan-shaped, end scrapers (Table 6; Figure 8c-d). Although not a particularly diagnostic form, comparable small end scrapers to these items have been reported from other Smallpoint Archaic sites (e.g. Ellis et al. 1990: Figure 4.25; Muller 1989: Figure 8; Ramsden 1976: Figure 12a-b). FC#3 (Figure 8d) has a 4.7 mm thick, 80-85° bit, and has a single notch in the centre of each side margin to facilitate hafting. The other end scraper (FC#49) is rather chunky with a thick (10.5 mm), steeply retouched (85-90°) bit. The left lateral margin has been steeply and continuously retouched all along the left margin and for 23 mm along the right margin from the platform end.

Other Tools from Area C

There are two other tools from Area C. One tool (FC#32) is a simple denticulate with a coarsely serrated distal margin. This tool is on a broad and short Onondaga chert flake, weighs 8.88 grams and measures 27.6mm by 40.3mm by 11.5mm

The final tool is designated as a "cobble spall scraper/bust-off" after W. Kenyon (1957:11) and was manufactured on a large (49.75 gm) flake of sub-greywacke, a coarser-grained, meta-sediment rock (Figure 7g). This specimen (FC#48) measures 72.3 by 51.1 by 10.1 mm. The flake has a completely unflaked dorsal surface indicating it was made on a primary spall knocked off a cobble – hence the derivation of the type name. The item displays the characteristic "scraper" retouch along all of its edges excluding the proximal edge. It was recovered from Feature #21A. Similar bust-off type scrapers on coarse-grained rocks were recovered from Inverhuron sites (Ramsden 1976:19; W. Kenyon 1957). A comparable item was also recovered from the southern excavation block in Area B at Green Hill (see Figure 2), an area that has also yielded a Smallpoint (Figure 7a). Like the linear blade-like flake tools described above, the cobble spall scrapers also seem diagnostic of the Small Point Archaic in the Lake Huron drainage. Their function is unknown but similar items were used in some areas ethnographically, such as in western North America, as hide working tools (Albright 1984).

INTERPRETATIONS

Excavations at Area C uncovered a small occupation area attributed to the Small Point Archaic. The stone points are similar to those of the Crawford Knoll style in outline shape and those points are dated to around 3400 BP at the Crawford Knoll site itself. However, the Green Hill points are relatively large and in this respect, seem more similar to items from Inverhuron Archaic sites just to the north that seem to date slightly later, to around 3000 BP. Clearly, we still do not fully understand neither the variation within these Terminal Archaic point forms nor the relative dating of these different styles. More detailed comparative studies are needed building upon Ian Kenyon's (1989) pioneering work in this area.

Aside from the points, the Area C excavations recovered other very distinctive forms, notably a retouched linear "blade-like" flake and a large cobble spall scraper on the coarse-grained rock sub-greywacke. Both items have also been regularly recovered from Inverhuron Archaic sites but seem to be absent on other Archaic components. Therefore, they also seem to be diagnostic of Terminal Archaic times and their presence along with the points suggests a relatively pure Small Point component at Area C. On the assumption long-term occupations would lack spatial patterning from constant use and reuse of areas, the suggestions of spatial patterning of activities in the area, notably the concentration of points and preforms just west of Feature 21/21A with other tools like end scrapers, the cobble spall scraper and drill in more peripheral areas (see Figure 3), suggests a relatively short term occupation at Area C and again argues that a relatively pure component is represented.

Analysis of the debris from Area C of the Green Hill site indicates that the main lithic reduction behaviour conducted was biface reduction and at least early stage roughing out of preforms occurred; although the use of ¼" mesh means that later stages of reduction would be under-represented. Certainly, early stage core reduction debris is relatively rare despite the presence of two blocky cores and three potential bipolar ones. However, as noted the blocky cores are little reduced and the bipolar pieces could be wedges or even battered edge fragments of early stage biface preforms.

The people at the Green Hill site were also retooling as suggested by the presence of several snapped point bases, which one assumes were brought to the site, bound in weapon shafts where they had broken, were removed and then replaced on site. Since there was little in the way of late stage debris, perhaps these broken points were replaced with new items made on site or ones already in a transported toolkit. These discarded points also suggest hunting was a site local activity -- and of larger game as stone points are used for that purpose (Ellis 1997). Processing of hides may have been another main activity given the presence of two chert end scrapers manufactured on Kettle Point chert; these items have been suggested to be hide-working tools by other investigators (Lennox 1986:228; Muller 1989) and a preference for scrapers made on Kettle Points for use in hide processing has been suggested (Lennox 1986:228, 1984: 68, 1981: 244). Moreover, as noted above, the bust-off scraper recovered from Area C resembles items used ethnographically in hide working. If the interpretation of Area C is correct in that the people were hunting and hide processing, one might extrapolate that the site was occupied during the late summer or fall period. This interpretation is highly speculative as floral and faunal materials were not recovered in the excavations and moreover, comparable tools occur at littoral components at Inverhuron, which seem to represent more warm weather activities although there may be some fall occupations there as well (for discussion see Ellis et al. 1990:111-114; Ramsden 1976). In fact, in terms of lithic artifacts, the only objects found at Inverhuron that are lacking at Green Hill are netsinkers. Further investigations at the Green Hill site, use-wear studies and so on are needed to flesh out and reinforce or nullify these interpretations.

The majority of the chert tools/preforms (64%) and flaking debris (91%) are on the more local Kettle Point chert and some of that material may have been obtained from more site local secondary cobbles as opposed to Kettle Point itself. The other material represented is Onondaga, which makes up 36% of the tools/preforms. Excepting a denticulate, the other Onondaga items from Area C are exclusively points or a recycled point (e.g. the notched drill). Indeed, 50% (3 of 6) of the projectile points/drill recovered were manufactured on Onondaga chert and, if we include the one recycled into a drill, Onondaga chert is actually the most commonly represented material (58%) in that general tool category. This pattern of lithic use, where points and sometimes point preforms as well are on different and usually more distant materials from the rest of the assemblage, is one seen at several other Small Point Archaic sites as discussed by Ellis and Spence (1997). They argued this pattern could be explained in one of two ways.

First, it could indicate that points or preforms were preferred in exchange relationships over other items and so are often on the more exotic or less common materials. This explanation has been put forward for a similar pattern on much earlier Paleoindian sites (Deller 1989). Second, it could be due to the serial procurement of different lithic sources during annual rounds. Ellis and Spence (1997) termed those procurement pattern "direct-embedded" as raw materials were obtained directly by trips to sources but embedded in overall patterns of movement. In this scenario the lithic resources present in an assemblage are viewed as mainly being a product of range mobility rather than due to trade or exchange systems or the idiosyncratic movement of individuals. Ellis and Spence (1997) raised the possibility that Small Point Archaic populations could have traversed most of southern Ontario during their annual rounds of activities using the two main sources found in the area: Onondaga and Kettle Point cherts. These populations procured the cherts in a sequential ("serial") and episodic manner when near to a particular source. While in a source area they over-produced items that required specialized blanks such as biface tools and preforms, as a means to avoid lithic resource shortfalls (Ellis and Spence 1997:135-137). When near the Kettle Point sources, for example, that material would be represented amongst the material from retooling at those sources such as debris and to some extent preforms, and amongst short-lived or more expedient unifacial tools that were not over-produced or were easier to produce from unspecialized blanks. Raw material from the previously visited source area, or Onondaga chert areas, would be represented more commonly amongst the longer-lived and over-produced tools such as points and/or their preforms. In short, the Onondaga items were the vestigial remnants of previous visits to the Onondaga source area. Ellis and Spence (1997) recognized it was hard to choose between these two explanations based on the small amount of data available to them but they favoured the direct-embedded procurement model rather than the exchange model. The main source of support they provided for such an explanation was the Welke-Tonkonoh site (Muller 1989), where the flaking debris and unifaces were all on Kettle Point whereas the points and preforms were all on Onondaga. They thought it unlikely that people would rely totally on exchange for their points/weapon tip materials.

Ellis and Spence's (1997) direct-embedded procurement model was evaluated by Pearce (2008) by examining Small Point Archaic lithic procurement behaviours at a regional scale. Data on source use was collected and examined from 54 sites located throughout southwestern Ontario including Green Hill Area C. It was reasoned that if the Ellis and Spence (1997) model held, sites near the Kettle Point chert source should have an overabundance of Onondaga chert amongst the points and perhaps preforms while the rest of the assemblage should be predominantly on the more local Kettle Point. Conversely, at sites closer to the Onondaga sources, Kettle Point should show up more often as points and preforms whereas the rest of the assemblage should be on Onondaga. What this study showed was that that was not the case and it was suggested Small Point Archaic people were not travelling all over southern Ontario utilizing both Kettle Point and Onondaga cherts during normal settlement movements. In particular, Onondaga points and preforms are common away from the Onondaga source area but one does not find an overabundance of projectile points and preforms on Kettle Point near the Onondaga sources. In fact, Kettle Point chert points are almost non-existent in that area. In short, Onondaga seems to be moving one way suggesting it was being exchanged regionally in the form of projectile points and performs, even into areas where other alternative lithic resources were available (Pearce 2008). This exchange of Onondaga over large areas actually should not be surprising as it was clearly exchanged over large areas in even earlier times. For example, Onondaga points are very common in the middle Ottawa river area on Middle Archaic sites (ca. 4500-5000 BP) where they make up 24 to 47% of the point assemblages despite the fact the Onondaga sources are located over 450 km away (Clermont and Chapdelaine 1998; Clermont et al. 2003; Chapdelaine and Clermont 2006). Regardless, what this study suggests is that the Onondaga chert points at Green Hill most likely reached the area via exchange systems.

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During the writing of the paper Ellis learned of the passing of Frank Wight, a long time London Chapter Member. Frank had a passionate interest in the landscape, history and archaeology of the Thedford area and had reported many important Paleoindian and Archaic sites to the professional archaeological community, notably Thedford II (Deller and Ellis 1992) and Adder Orchard (Fisher 1997). He was a regular visitor and volunteer excavator on the Green Hill excavations, which were located very near his farm. Frank was a constant source of knowledge and advice about the history and archaeology of the area. It was a pleasure to know him and he will be sadly missed.

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